

## General

### Guideline Title

Pain management for blunt thoracic trauma: a joint practice management guideline from the Eastern Association for the Surgery of Trauma and Trauma Anesthesiology Society.

### Bibliographic Source(s)

Galvagno SM Jr, Smith CE, Varon AJ, Hasenboehler EA, Sultan S, Shaefer G, To KB, Fox AD, Alley DER, Ditillo M, Joseph BA, Robinson BRH, Haut ER. Pain management for blunt thoracic trauma: a joint practice management guideline from the Eastern Association for the Surgery of Trauma and Trauma Anesthesiology Society. J Trauma Acute Care Surg. 2016 Nov;81(5):936-51. [40 references] [PubMed](#)

### Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Eastern Association for the Surgery of Trauma (EAST). Pain management in blunt thoracic trauma (BTT). Winston-Salem (NC): Eastern Association for the Surgery of Trauma (EAST); 2004. 79 p. [114 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

## Regulatory Alert

### FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

[August 31, 2016 – Opioid pain and cough medicines combined with benzodiazepines](#)

: A U.S. Food and Drug Administration (FDA) review has found that the growing combined use of opioid medicines with benzodiazepines or other drugs that depress the central nervous system (CNS) has resulted in serious side effects, including slowed or difficult breathing and deaths. FDA is adding Boxed Warnings to the drug labeling of prescription opioid pain and prescription opioid cough medicines and benzodiazepines.

## Recommendations

# Major Recommendations

The strength of recommendation (strong or weak/conditional) and levels of evidence (high, moderate, low or very low) are defined at the end of the "Major Recommendations" field.

## Population, Intervention, Comparator, and Outcome (PICO) Question 1

In adult patients with blunt thoracic trauma (P), does epidural analgesia (I) versus nonregional modalities of pain control (C) (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, nonsteroidal anti-inflammatory drugs [NSAIDs]) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

### Recommendation

In adult patients with blunt thoracic trauma, the guideline authors conditionally recommend epidural analgesia over nonregional modalities of pain control (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs) for the treatment of pain. This recommendation is based on very low-quality evidence but places a high value on patient preferences for analgesia. If certain confounders (or effect modifiers) such as age, number of rib fractures, or severity of injury are considered, a stronger positive magnitude of effect may be observed for certain outcomes of interest.

## PICO Question 2

In adult patients with blunt thoracic trauma (P), does paravertebral block (I) versus nonregional modalities of pain control (C) (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

### Recommendation

It is important to note that paravertebral block had equivalent pain control compared with epidural analgesia and provided significant pain relief compared with baseline. While desirable consequences probably outweigh undesirable consequences, because of the lack of studies comparing paravertebral block to nonregional pain control modalities, the guideline authors are unable to make a recommendation regarding the use of paravertebral blocks.

## PICO Question 3

In adult patients with blunt thoracic trauma (P), does continuous intrapleural infusions of local anesthetics (I) versus other regional modalities of pain control (C) (i.e., epidural or paravertebral nerve blocks) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

### Recommendation

There is limited available literature regarding intrapleural analgesia for blunt thoracic trauma. The few studies that were identified were of very poor methodological quality. Because of insufficient evidence, the guideline authors are unable to make a recommendation.

## PICO Question 4

In adult patients with blunt thoracic trauma (P), does multimodal analgesia (I) (i.e., use of different classes of analgesics, including combinations of opioids with other agents such as NSAIDs, pregabalin/gabapentin, acetaminophen) compared with opioids alone (C) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

### Recommendation

Although the quality and quantity of evidence for the use of multimodal analgesia in adult patients with

blunt thoracic trauma are very limited, the guideline authors conditionally recommend this modality. This recommendation is based on very low-quality evidence but places a high value on patient preferences for analgesia. There is some indirect evidence that multiple analgesic modalities (i.e., transdermal fentanyl, NSAIDs), when combined, decrease pain in patients with blunt thoracic trauma. Use of alternative agents for patients with refractory pain is consistent with the clinical experience of the group, as patients often seek alternatives when a standard sole opioid regimen fails. Moreover, standard sole opioid regimens are often associated with adverse effects, especially as doses are escalated, thus requiring consideration for additional nonopioid analgesics.

PICO Question 5

In adult patients with blunt thoracic trauma (P), does continuous intercostal infusions of local anesthetics (I) versus nonregional modalities of pain control (C) (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

Recommendation

Because of the lack of studies that fulfilled the inclusion criteria, no evidence profile was created. Because of insufficient evidence, the guideline authors are unable to make a recommendation.

Definitions

Grading of Recommendations Assessment, Development and Evaluation (GRADE) Methodology Levels for Rating the Quality of Evidence

Quality Level	Definitions
High	Very confident that the true effect lies close to estimate of effect
Moderate	Moderate effect; true effect is likely close to estimate of effect but may be substantially different
Low	Limited confidence; true effect may be substantially different from estimate of effect
Very Low	Little confidence; true effect likely substantially different from estimate of effect

GRADE Definition of Strong and Weak Recommendation

	Strong Recommendation	Weak/Conditional Recommendation
For patients	Most patients would want the recommended course of action.	Most patients would want the recommended course of action, but many would not.
For clinicians	Most patients should receive the recommended course of action.	Different choices will exist for different patients, and clinicians should help patients decide.
For policy makers	Recommended course should be adopted as policy.	Considerable debate and stakeholder involvement needed to make policy.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Pain associated with blunt thoracic trauma

## Guideline Category

Management

Treatment

## Clinical Specialty

Anesthesiology

Critical Care

Emergency Medicine

Thoracic Surgery

## Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

## Guideline Objective(s)

- To provide updated evidence-based recommendations that may be used to direct the decision-making processes related to the care of patients with blunt thoracic trauma
- To evaluate the optimal mode of analgesia for patients with blunt thoracic trauma

## Target Population

Hospitalized adult patients (>16 years of age) with blunt thoracic trauma

## Interventions and Practices Considered

1. Epidural analgesia versus (vs.) nonregional modalities of pain control (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, nonsteroidal anti-inflammatory drugs [NSAIDs])
2. Multimodal analgesia (i.e., use of different classes of analgesics, including combinations of opioids with other agents such as NSAIDs, pregabalin/gabapentin, acetaminophen) vs. opioids alone

Note: The following were considered but no recommendation was made because of insufficient evidence: paravertebral blockade vs. nonregional modalities of pain control (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs), continuous intrapleural infusions of local anesthetics vs. other regional modalities of pain control (i.e., epidural or paravertebral nerve blocks) continuous intercostal infusions of local anesthetics vs. nonregional modalities of pain control (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs).

## Major Outcomes Considered

- Analgesia
- Postoperative pulmonary complications

- Pulmonary function
- Need for mechanical ventilation
- Hospital or intensive care unit (ICU) length of stay
- Mortality
- Cost
- Ventilator days
- Labor-intensiveness

## Methodology

### Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

### Description of Methods Used to Collect/Select the Evidence

#### Inclusion Criteria for This Review

##### Study Types

The guideline authors included randomized controlled trials (RCTs), case-control studies, and prospective or retrospective observational cohort studies (with a comparator group). Reviews containing no original data or comments were excluded.

##### Participant Types (Population, P)

Only studies pertaining to the treatment of hospitalized patients with blunt thoracic trauma were included. Blunt thoracic trauma was defined as chest wall injuries such as rib fracture, flail chest, sternal fracture, and soft tissue contusion; intrapleural lesions such as hemothorax and pneumothorax; parenchymal lung injuries such as pulmonary contusion and lung laceration; and mediastinal lesions such as blunt cardiac injury or great vessel injury. The guideline authors included studies of adult patients (>16 years of age) without restricting gender, ethnicity, or degree of comorbidity.

##### Intervention Type (I)

The guideline authors included studies in which regional anesthetic techniques, such as epidural or paravertebral catheters, intercostal nerve blocks, multimodal approaches (i.e., opioids plus pregabalin/gabapentin, or other nonregional drug combinations), or intrapleural infusions of anesthetics, were used compared with nonregional techniques such as use of intravenous or enteral analgesics (i.e., opioids, acetaminophen, NSAIDs).

##### Outcome Measure Types (O)

Outcomes were chosen by group consensus as recommended by the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach. Outcomes were chosen by the committee and rated in importance from 1 to 9, with scores of 7 to 9 representing critical outcomes and scores of 4 to 6 representing important outcomes. Critical outcomes for all five PICO (Population, Intervention, Comparator, Outcome) questions included analgesia (as measured by a validated pain scale such as the visual analog scale), postoperative pulmonary complications (PPCs), and pulmonary function as evidenced by objective measures, requirement for intubation, and mortality. Important outcomes included hospital or intensive care unit (ICU) length of stay. Additional outcomes considered by the committee were cost,

ventilator days, and labor-intensiveness.

Review Methods

Search Strategy

A systematic search of the PubMed, EMBASE, CINAHL, MEDLINE (OVID), and The Cochrane Register of Controlled Trials electronic databases was performed by the primary author for studies published from January 1967 to October 2015. A systematic search of the National Institutes of Health MEDLINE database was performed using PubMed. Search terms included the following: *Epidural Analgesia* [MeSH], *thoracic epidural analgesia*, *thoracic epidural*, *blunt thoracic trauma*, *Thoracic Injuries* [majr], *pneumothorax*, *hemothorax*, *rib fracture(s)*, *sternal fracture*, *chest contusion*, *Randomized Controlled Trial* [Publication Type], *Cohort Studies* [MeSH], *Case-control Studies* [majr], *Mortality* [MeSH], *Hospital Mortality* [MeSH], *reintubation*, *pneumonia* [MeSH], *Pulmonary Atelectasis* [majr], *Respiratory Function Tests* [MeSH], *Analgesia* [MeSH], *Analgesia, Patient-controlled* [MeSH], *Pain Measurement* [MeSH], *Length of Stay* [MeSH], *postoperative pulmonary contusions*. A similar systematic search of the EMBASE database was performed using the following search terms (including Emtree mapping terms): *epidural anesthesia*, *thorax blunt trauma*, *blunt AND thoracic AND trauma*, *pneumothorax*, *hemothorax*, *lung AND contusion*, *pulmonary AND contusion*, *flail chest*, *chest AND contusion*, *thoracic AND epidural AND analgesia*, *epidural OR regional AND anesthesia*, *postoperative complications*, *reintubation*, *randomized controlled trial*, *cohort analysis*, *case control study*. For PICO Questions 2 to 5, the searches were adjusted accordingly, using terms for the analgesic intervention of interest (i.e., "epidural analgesia" was replaced with "paravertebral block," etc.). The methodology for the MEDLINE and EMBASE searches was used to conduct searches in The Cochrane Register of Controlled Trials and CINAHL. Non-English articles, when included, were reviewed by multilingual members of the research team. In addition to the electronic search, the guideline authors manually searched the bibliographies of included studies and recent review articles.

Number of Source Documents

The original search yielded 332 records, of which 70 were deemed to be appropriate for full text review (see Figure 1 in the original guideline document). The guideline authors excluded 42 studies that were descriptive only in nature and did not have a comparator. Included studies were independently assessed by two authors; discrepancies were adjudicated by the primary author. The authors ultimately included 28 studies in this guideline for recommendation.

Refer to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) study flow diagram (Figure 1) in the original guideline document.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Grading of Recommendations Assessment, Development and Evaluation (GRADE) Methodology Levels for Rating the Quality of Evidence

Quality Level	Definitions
High	Very confident that the true effect lies close to estimate of effect.
Moderate	Moderate effect; true effect is likely close to estimate of effect but may be substantially different.
Low	Limited confidence; true effect may be substantially different from estimate of effect.

Quality Level	Definitions
Very Low	Little confidence; true effect likely substantially different from estimate of effect.

## Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

## Description of the Methods Used to Analyze the Evidence

All 28 studies included in the guideline for recommendations were analyzed qualitatively, whereas only 12 of these studies could be included for quantitative analysis (meta-analysis). All 12 studies analyzed quantitatively pertained to Population, Intervention, Comparator, and Outcome (PICO) Question 1. For PICO Questions 2, 4, and 5, although no articles that met the strict inclusion criteria for evaluation could be found, a qualitative review was performed for articles that were tangentially pertinent to this recommendation.

### Assessment of the Quality of Evidence

The quality of the evidence for each outcome in a PICO was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework. While randomized controlled trials (RCTs) were considered high-quality evidence, the guideline authors rated down for quality if there were concerns that lowered their certainty in the estimate of effect for that outcome. The guideline authors evaluated for risk of bias, inconsistency (also referred to as heterogeneity), indirectness, imprecision, and other considerations (e.g., publication bias). Observational studies, by default, were considered low-quality evidence, but could be rated up under the following circumstances: large effect, dose-response gradient, or if all possible confounders would decrease an effect or move the effect in the opposite direction.

### Risk-of-Bias Assessment

Risk of bias was assessed for each outcome using the instrument developed by the Cochrane Collaboration and the Jadad Scale. The Cochrane instrument includes the domains of random sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and baseline imbalance and bias due to vested financial interest. The Jadad score, which assesses randomization, blinding, and patient withdrawals/dropouts, was used to grade included studies with a score between 0 and 5. For nonrandomized studies, the Downs and Black assessment tool was used. This instrument includes assessment items for reporting bias, external validity, internal validity, confounding, and selection bias. For both the Cochrane and Downs and Black assessment tools, if one or more domains were judged as being high or unclear, the guideline authors classified the trial as having a high risk of bias. Systematic reviews were assessed with the AMSTAR instrument, a tool designed to assess the methodological quality of systematic reviews.

### Statistical Analyses

When a quantitative analysis was indicated, the guideline authors calculated relative risk with 95% confidence intervals (CIs) for dichotomous outcome measures and the mean difference (MD) with 95% CI for continuous outcome measures using the Mantel-Haenszel random-effects model. These measures were pooled in conventional cumulative meta-analyses for each critical and important outcome included in this recommendation. Heterogeneity, or inconsistency, was assessed using the  $I^2$  statistic (inconsistency factor). An  $I^2$  value more than 50% was suggestive of moderate heterogeneity, and a value greater than 75% indicated substantial heterogeneity due to real differences in protocols, trial populations, interventions, and/or outcomes. The meta-analysis was performed using the Cochrane Collaboration's "Revman" software (version 5.3; Cochrane Collaboration, Oxford, UK). Evidence tables were created using

the GRADE Working Group's open access Guideline Development Tool (May 25, 2015, update; Evidence Prime, Inc., Hamilton, Ontario, Canada). All tests were two-tailed, and  $p < 0.05$  was considered statistically significant.

## Methods Used to Formulate the Recommendations

Expert Consensus

### Description of Methods Used to Formulate the Recommendations

This guideline has been developed using the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) framework adopted by the Eastern Association for the Surgery of Trauma (EAST) (see the "Availability of Companion Documents" field).

The GRADE framework, now in use by more than 90 international societies and organizations worldwide, provides a systematic and transparent framework for clarifying questions, determining the outcomes of interest, summarizing the evidence for such questions, and moving from evidence to a recommendation or decision. Importantly, within GRADE, the evidence is rated not according to each individual study, but across studies for specific patient-important clinical outcomes. Recommendation strength and direction are based not only on evidence quality but also on the balance between desirable and undesirable outcomes and patient values and preference.

The Population (P), Intervention (I), Comparator (C), and Outcome (O) (PICO) questions are defined as follows:

PICO Question 1: In adult patients with blunt thoracic trauma (P), does epidural analgesia (I) versus nonregional modalities of pain control (C) (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, nonsteroidal anti-inflammatory drugs [NSAIDs]) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

PICO Question 2: In adult patients with blunt thoracic trauma (P), does paravertebral blockade (I) versus nonregional modalities of pain control (C) (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

PICO Question 3: In adult patients with blunt thoracic trauma (P), does continuous intrapleural infusions of local anesthetics (I) versus other regional modalities of pain control (C) (i.e., epidural or paravertebral nerve blocks) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

PICO Question 4: In adult patients with blunt thoracic trauma (P), does multimodal analgesia (I) (i.e., use of different classes of analgesics, including combinations of opioids with other agents such as NSAIDs, pregabalin/gabapentin, acetaminophen) compared with opioids alone (C) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

PICO Question 5: In adult patients with blunt thoracic trauma (P), does continuous intercostal infusions of local anesthetics (I) versus nonregional modalities of pain control (C) (i.e., intravenous or enteral analgesics such as opioids, acetaminophen, NSAIDs) improve analgesia, decrease pulmonary complications and need for mechanical ventilation, shorten length of stay, and/or decrease mortality (O)?

### Rating Scheme for the Strength of the Recommendations

Grading of Recommendations Assessment Development, and Evaluation (GRADE) Definition of Strong and Weak Recommendation



	Strong Recommendation	Weak/Conditional Recommendation
For patients	Most patients would want the recommended course of action.	Most patients would want the recommended course of action, but many would not.
For clinicians	Most patients should receive the recommended course of action.	Different choices will exist for different patients, and clinicians should help patients decide.
For policy makers	Recommended course should be adopted as policy.	Considerable debate and stakeholder involvement needed to make policy.

## Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

## Method of Guideline Validation

Not stated

## Description of Method of Guideline Validation

Not applicable

## Evidence Supporting the Recommendations

### Type of Evidence Supporting the Recommendations

The type of evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

## Benefits/Harms of Implementing the Guideline Recommendations

### Potential Benefits

Pain is acknowledged as a contributing element for much of the morbidity associated with blunt thoracic trauma, and optimization of analgesia is an essential component of a strategy that uses early mobilization and chest physiotherapy to enhance recovery.

### Potential Harms

- Epidural analgesia is associated with potentially troublesome adverse effects such as hypotension, and is technically demanding. Historical concerns about epidural analgesia include loss of lower-extremity sensation, a requirement for bladder catheterization, and venous pooling, which might precipitate deep venous thrombosis.
- Standard sole opioid regimens are often associated with adverse effects, especially as doses are escalated, thus requiring consideration for additional nonopioid analgesics.

# Contraindications

## Contraindications

Epidural analgesia is contraindicated in patients with coagulopathy.

# Qualifying Statements

## Qualifying Statements

- The Eastern Association for the Surgery of Trauma (EAST) is a multi-disciplinary professional society committed to improving the care of injured patients. The Ad Hoc Committee for Practice Management Guideline Development of EAST develops and disseminates evidence-based information to increase the scientific knowledge needed to enhance patient and clinical decision-making, improve health care quality, and promote efficiency in the organization of public and private systems of health care delivery. Unless specifically stated otherwise, the opinions expressed and statements made in this publication reflect the authors' personal observations and do not imply endorsement by nor official policy of EAST.
- "Clinical practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances."\* These guidelines are not fixed protocols that must be followed, but are intended for health care professionals and providers to consider. While they identify and describe generally recommended courses of intervention, they are not presented as a substitute for the advice of a physician or other knowledgeable health care professional or provider. Individual patients may require different treatments from those specified in a given guideline. Guidelines are not entirely inclusive or exclusive of all methods of reasonable care that can obtain/produce the same results. While guidelines can be written that take into account variations in clinical settings, resources, or common patient characteristics, they cannot address the unique needs of each patient nor the combination of resources available to a particular community or health care professional or provider. Deviations from clinical practice guidelines may be justified by individual circumstances. Thus, guidelines must be applied based on individual patient needs using professional judgment
- These guidelines represent a detailed summary and comprehensive overview of the literature regarding analgesia for blunt thoracic trauma. They are meant to inform the decision-making process and not replace clinical judgment. The overall risk of bias for all studies was high (see Figure 5 in the original guideline document), with the exception of a few small, underpowered studies. The limitations with the available literature precluded the formulation of strong recommendations by the panel (see Table 3 in the original guideline document).

\*Institute of Medicine. Clinical practice guidelines: directions for a new program. MJ Field and KN Lohr (eds) Washington, DC: National Academy Press. 1990: pg 39.

# Implementation of the Guideline

## Description of Implementation Strategy

An implementation strategy was not provided.

# Institute of Medicine (IOM) National Healthcare Quality Report Categories

# IOM Care Need

Getting Better

## IOM Domain

Effectiveness

# Identifying Information and Availability

## Bibliographic Source(s)

Galvagno SM Jr, Smith CE, Varon AJ, Hasenboehler EA, Sultan S, Shaefer G, To KB, Fox AD, Alley DER, Ditillo M, Joseph BA, Robinson BRH, Haut ER. Pain management for blunt thoracic trauma: a joint practice management guideline from the Eastern Association for the Surgery of Trauma and Trauma Anesthesiology Society. J Trauma Acute Care Surg. 2016 Nov;81(5):936-51. [40 references] [PubMed](#)

## Adaptation

Not applicable: The guideline was not adapted from another source.

## Date Released

2016 Nov

## Guideline Developer(s)

Eastern Association for the Surgery of Trauma - Professional Association

Trauma Anesthesiology Society - Nonprofit Organization

## Source(s) of Funding

Eastern Association for the Surgery of Trauma (EAST) and Trauma Anesthesiology Society

## Guideline Committee

Pain Management for Blunt Thoracic Trauma Guidelines Committee

## Composition of Group That Authored the Guideline

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## Financial Disclosures/Conflicts of Interest

The authors declare no conflicts of interest.

## Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Eastern Association for the Surgery of Trauma (EAST). Pain management in blunt thoracic trauma (BTT). Winston-Salem (NC): Eastern Association for the Surgery of Trauma (EAST); 2004. 79 p. [114 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

## Guideline Availability

Available from the [Journal of Trauma and Acute Care Surgery Web site](#) .

## Availability of Companion Documents

The following is available:

Kerwin AJ, Haut ER, Burns JB, Como JJ, Haider A, Stassen N, Dahm P, Eastern Association for the Surgery of Trauma Practice Management Guidelines Ad Hoc Committee. The Eastern Association of the Surgery of Trauma approach to practice management guideline development using Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology. *J Trauma Acute Care Surg*. 2012 Nov;73(5 Suppl 4):S283-7. Available from the [Eastern Association for the Surgery of Trauma \(EAST\) Web site](#) .

## Patient Resources

None available

## NGC Status

This NGC summary was completed by ECRI on February 10, 2005. This summary was updated by ECRI Institute on February 13, 2017. The updated information was verified by the guideline developer on March 1, 2017.

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